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GUIDELINES FOR PREPARATION  
OF AN ENVIRONMENTAL IMPACT STATEMENT  
ON THE PROPOSED PARALLEL RUNWAY AT  
VANCOUVER INTERNATIONAL AIRPORT

JUNE 29, 1978

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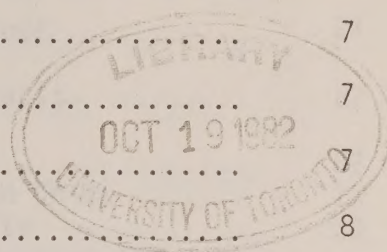
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Guidelines for the Preparation of an Environmental<sup>\*</sup> Impact Statement  
on the Proposed Parallel Runway at Vancouver International Airport

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PREFACE

These guidelines are to provide guidance and instructions for preparing the Environmental Impact Statement (EIS) for the proposed addition of a parallel runway at Vancouver International Airport.

Vancouver International Airport has developed as the site on the B.C. Lower Mainland which serves airline travellers. Transport Canada expects that the airport will retain its role indefinitely. In order to accommodate expansion, there have been long-standing general proposals for a second east-west runway. The proposals developed public significance in 1973 when definite schemes for construction were announced. The Airport Planning Committee (APC) was formed from government, industry and citizens groups to evaluate the proposal. Although the process led to thorough discussion of matters relating to the proposed runway, no agreements were finalized.

The APC published its report in March 1976 and it was followed by a period in which the Minister of Transport received public comment on the report and on a revised proposal to confine the parallel runway within the dyke.

Because the Environmental Assessment and Review Process (EARP)<sup>\*\*</sup> came into existence after the start of the APC process, the APC studies

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\* Throughout these guidelines "environment" will mean physical, biological and social environment as related to the proposal.

\*\* Environmental Assessment Panel, 1977. A Guide to the Federal Environmental Assessment and Review Process. Fisheries and Environment Canada. Information Services Directorate, Ottawa. 18 pp.







were not specifically aligned with this Process. The Process specifies that all federal departments and agencies take environmental matters into account in their project planning. For projects of potentially significant environmental implications, the initiating department or agency requests the establishment of an Environmental Assessment Panel. Transport Canada has done this for the subject modified runway proposal.

Transport Canada will prepare an Environmental Impact Statement based on guidelines issued by the Environmental Assessment Panel. The guidelines have been prepared following public consideration and comment.

After Transport Canada has prepared the EIS based on the guidelines, the Panel will review the Statement, initiate hearings to receive advice from other sources including the public and report to the Federal and Provincial Environment Ministers. The Federal Minister of Transport after discussion with the Minister of the Environment, will then decide whether the project shall proceed and, if so, under what conditions.

The Panel's task is to provide recommendations on the environmental issues of the proposal in order to help the federal government decide:

- (a) Should there be a second east-west runway at Vancouver International Airport?
- (b) If so, under what conditions should it be constructed and operated?







Transport Canada will make use of the APC reports and all other relevant background material. It is not intended that any aspect of these studies which might be relevant to the present analysis be undertaken again, but that these documents be built on and supplemented where necessary.

It is expected that Transport Canada, during the preparation of the EIS, will develop a public consultation program. When the EIS has been completed and presented to the Panel for review by Transport Canada, the Panel will seek public involvement in the review and will hold public hearings. All interested parties will have an opportunity to present their views on the environmental aspects of the proposal to the Panel. At the Panel's public hearings, Transport Canada representatives will be present to answer questions about the EIS.

The EIS should have the following format and content:

1. SUMMARY

This summary should allow a reviewer to obtain both a concise idea of the contents of the EIS and to focus on items of specific interest. It should be understandable to the general public and lend itself to easy use by those requiring a rapid appraisal of the situation. It includes:

- an outline of the need for the project
- a concise evaluation of the alternatives considered





- a brief description of the selected project proposal and the location for which it is proposed
- a concise summary of the major environmental conditions in the area which may be affected by the project
- a description of the probable major environmental impacts; the mitigation measures to be implemented, and the significance of any unmitigable residual effects
- a summary of other impacts to be expected.

The summary should identify limitations on the EIS created by information deficiencies.

The EIS summary should be prepared for wide distribution by the initiator as a document separable from the Environmental Impact Statement. It should explain to readers who require a more detailed account, where it could be found in the Impact Statement. A sufficient number of copies should be produced for agency and public use. The number of copies required shall depend upon anticipated demand and shall be determined at the time of publication.

## 2. THE NEED FOR THE PROJECT

Transport Canada will state and document the need for the project in sufficient detail to make clear the reasons for





proposing the project, together with the supporting rationale. This should include a clear outline of the consequences of not proceeding.

The Panel has received public comment pertaining to need which is outlined in Appendix A to this document and is contained in detail in the transcript of public meetings and written record of public input.

The Panel recommends that Transport Canada address this separately and publicly, not as part of the Environmental Impact Statement, to answer questions on the need for the project which are identified in this transcript.

### 3. THE DESCRIPTION OF ALTERNATIVES

3.1 Identify and describe all means considered for satisfying the demands which have been considered by Transport Canada.

Indicate all alternate sites which have been investigated by Transport Canada.

Describe the alternate selected and state why the remainder were rejected. Outline and explain decision process. All the alternatives considered should be discussed in as similar a fashion as possible, using comparable data and statistics, in order that comparisons may be readily made. In discussing alternatives, all of the following concepts should be discussed:





- no action
- better use of existing airports
- alternative sites
- alternative designs on preferred airports
- alternative configurations within the dyke at V.I.A.
- aircraft type separation (small aircraft from large aircraft), e.g., a shorter parallel runway for small aircraft at V.I.A. or removal of small aircraft to another facility
- diversion of some air carriers to other facilities (intransit, charter or freight carriers)
- modifications to flight operations and flight schedules, including re-routing throughout western Canada and changes in air traffic control procedures.

Some of the factors to be discussed are outlined below:

- ease of travel
- property values
- agricultural land
- short term environmental disruption
- potential of recovery or rehabilitation





- potential long term disruption to the environment (noise, air, wildlife) and to the surrounding communities
- safety
- technical feasibility (re air operations)
- cost of alternatives which have not been rejected for other reasons.

#### 4. THE PROJECT PROPOSAL

##### 4.1 Objective

The objective of the project should be clearly stated. This should include:

- why it is being proposed
- the time period over which the runway can be expected to remain in use
- who will benefit from the runway.

##### 4.2 General Description of Project

Describe generally what is needed to achieve the objective, including a description of the air space requirements, safety standards related to runway length and other major requirements needed to support the runway. What is the likelihood of the runway being lengthened in the future (i.e., for noise mitigation





or safety or to increase flexibility of airport operations); will there be any change in the use of the cross-wind runway?

Describe the region in which the project is proposed. This section should set the scene for consideration of the project in order to give the reader a general appreciation of the project as a prelude to the following more detailed descriptions in Section 5. This section should include:

- a synopsis of the distribution of population and land uses in the Lower Mainland
- a description of physical limits to growth in the region
- a synopsis of the ecological significance of the project location
- a brief description of the local transportation system and local priorities.

## 5. DESCRIPTION OF THE PROPOSAL

### 5.1 Location of the proposal

- Description of location at Sea Island
- why it is the optimum location within the confines of Sea Island.



## 5.2 Regional context

- Should provide projections of airport facility developments and requirements to the year 1995 in the regional context
- should be of sufficient detail to allow the review of relationships of both present and future facilities to the resources (urban, rural, ecological, transportation) of Vancouver and Richmond.

## 5.3 Existing and proposed facility requirements

Extent, magnitude and location of existing and required support facilities for passengers and aircraft both on and off site should be described. Indicate precisely the extent to which the cross-wind runway is a future requirement.

## 5.4 Existing and proposed aircraft movements

A description of present and expected future aircraft activity both on and off ground should be provided, such as flight paths (including Pitt Localizer and air space requirements).





### 5.5 Operational and maintenance requirements for facilities and aircraft

The present and future operational requirements of 5.3 and 5.4 should be described, including items such as water supply and waste disposal requirements.

### 5.6 Construction activities

Describe the construction activities, e.g., phasing, methods to be followed and location of activity. Activities can be grouped as follows:

1. Pre-construction phase
2. Construction phase
3. Rehabilitation of disturbed areas.

## 6. ENVIRONMENTAL STATE AND RESOURCE USES IN THE STUDY AREA

This section should identify and describe the existing (and future, where feasible) physical, biological and social environmental elements and characteristics that are likely to be impacted upon or affected to any substantial degree by the proposal. Relevant present and future resource uses at and adjacent to the site of the project should also be documented. Any important data gaps should be identified.





It is expected that this section will cover topics such as: soils, vegetation, climate and ambient conditions, river systems and hydrology, fish and aquatic systems, wildlife, present land and resource use and recreation.

## 7. ENVIRONMENTAL IMPACTS

### 7.1 Description and scope of impacts

Describe and evaluate (quantitatively where possible) the probable environmental impacts of the activities outlined in 5.3 - 5.6, on the environment described in Section 6, Environmental State and Resource Uses. Discuss precisely which item(s) or aspect(s) (physical, biological, social, etc.) will be affected and the nature of the effect or change. When assessing the severity or magnitude of the impact, attention should be given to the identification of areas where the accumulation of minor impacts may cause major impacts. The potential environmental impact should also be discussed in terms of possible secondary impacts which may result from proposed mitigation measures. The relative significance of impacts whether primary or secondary should be noted. This section should include those impacts that change existing features, conditions or processes in the



natural environment and those which change established resources and ways of life or change the quality of life in the area.

## 7.2 Specific Impacts

In addition to the guideline in 7.1, there are some areas of potential environmental concern which should be specifically addressed, if they are not already covered in 7.1 and if they are relevant. These are:

### 7.2.1 (a) Land Impacts

- Impact of the project-specific borrow sites, if any, on aesthetics, erosion and biotic resources
- effects of excavation and stockpiling of dredge material on the land area.

### (b) Air Quality

The following are required:

- ambient air surveillance study to determine the present air quality around the airport
- existing and potential new or increased air pollution sources





are to be listed and emissions quantified including those from airport related activities (heating plants, incinerators and mobile sources, aircraft, cars)

- assessment of the impact on ambient air quality from new airport generated pollutants
- episodic and non episodic air quality conditions should be analysed with respect to public health and photo-chemical smog.

(c) Noise

i. Purpose

The purpose of the aircraft noise analysis is to provide detailed information concerning the changes to the noise environment affecting the communities surrounding the airport that would result from completion of the proposed parallel runway to permit an assessment of the impacts. It is intended that this information be displayed in a manner which is understandable and useful to both lay and technical readers.





## ii. Background

The final Report of the Airport Planning Committee (February 1976) and associated supporting reports\* provide extensive documentation of an earlier proposal for a parallel runway which is closely related to the present proposal. Included were:

- mapping of contours of equal noise exposure, using the day-night average sound level ( $L_{dn}$ ) methodology, from a base line of 55 dBA. (This covered all material changes in noise level to be expected in inhabited areas, i.e., 5 dBA or greater.)
- a method for judging the relative overall impact on each of the different communities

- 
- \* 1. Aeronautical Noise Study. Vol. 1 Main Report: Vol. 2 Appendices. Airport Planning Committee, June 1975
2. Report 7640. Noise Measurement Survey, Vancouver International Airport. January 1974. 6 Vols. of data plus 2 vols. of explanation.
3. Report 7462-1. Review of the Noise Measurement Survey at V.I.A. (Summary of Item 2) July 1974
4. Report 7469-1. Sound Level Measurements of Aircraft Utilizing Runway 1230. October 1974
5. Report 7469-2. Aircraft Sound Level Measurements of Ground Activities at V.I.A. October 1974
6. Report 7481-1. Noise Measurement of Selected Aircraft Flyover Noise Events at V.I.A. May 1974
7. Report 7463-1. Summary of Peak dBA (Flow) and LEX Measured Data for Air Carrier Noise Events. November 1974



- separate means, where necessary, of judging exposures for specific effects on people such as hearing damage and interference with sleep
- a discussion of the effects of noise on people which related all the above measures to these effects
- a technique for predicting noise exposure which allowed for the relevant weather and topography
- measurements of background noise in the communities surrounding the airport
- consideration of special situations, such as hospitals or schools.

These reports provide a good foundation for analysis of the present proposal. The methodology used in the APC studies is very similar to that proposed recently by the United States National Research Council in their "Guidelines for Preparing Environmental Impact Statements on Noise", (National Academy of Sciences, Washington, D.C., 1977) and relatively minor updating of this methodology via these latter guidelines would be





useful, most notably to reflect the new consensus on levels of annoyance. The data base should be updated to the time of preparation of the EIS.

iii. Analysis

The noise analysis for the proposed project should be prepared in a format such that it relates to the background material above and the comments received during the public hearings on these guidelines in September, 1977.

The analysis shall provide sufficient details for a comparative evaluation of three conditions:

1. The airport and present runway system with present levels of aircraft activity and existing community development.
2. The airport and present runway system with projected future levels of aircraft activity (to 1995) and future planned community development.
3. The airport and proposed runway system with projected future levels of aircraft activity (to 1995) and future planned community development.



All assumptions used in the analysis including runway utilization patterns, aircraft and air traffic control operating procedures and mitigational measures shall be documented. (The community development plans are expected to be provided by regional and local authorities.)

Noise from the following should be considered:

- all ground based activity associated with the airport, including operation of engine test-cells, ground engine run-ups and general ground transportation activity.
- changes or additions to flight corridors and the aircraft activity within these corridors
- construction activities.

iv. Review of the Recommendations of Previous Studies

In the final report of the Airport Planning Committee 18 methods





(Items 7.1-1(a) to (p) on pages 41-42) are recommended for the aeronautical sector (as distinct from the community sector) to minimize the impact of aircraft noise (mitigation) using existing facilities. Transport Canada shall describe its response to these recommendations in order to establish its capacity to carry out mitigational procedures.

v. Compliance Monitoring

Outline the steps to be taken to ensure that the procedures assumed in the analysis of noise impact in part 3 above are followed in practice.

vi. Recommendations

Where the analysis indicates a residual noise impact after the mitigational measures described above have been taken, recommend practical methods for coping with the impact.

(d) Water Quality

The following are required:

- changes in run-off patterns due to runway and associated developments including chemical and toxicity characteristics of drainage waters



- documentation explaining any increased use of de-icing and anti-icing agents on the new runway
- changes in flow, chemical and toxicity characteristics of the V.I.A. sewage component to the Iona Island Sewage Treatment Plant
- probable impacts on aquatic and terrestrial food chains (possible synergistic effects).

#### 7.2.2 Biological Impacts (where relevant to the proposal)

Should be viewed in terms of the Fraser Estuary/Delta and marine areas as an ecological unit.

##### (a) Plants

- Impact on specific terrestrial and aquatic plant communities and species especially as they related to habitat and food resources for specific animal communities
- probable changes in the plant eco-system should be related to the total available in the project area, include impact on animals dependent on these communities
- disruption of normal ecological succession of plant communities and the resultant





impacts on ecosystem productivity,  
habitat and ultimately animal  
populations and distribution.

(b) Birds

- Interruption of migratory and resident bird species movement patterns and change of viability of species
- impact on bird populations including chance of bird strikes
- impact on migratory and resident waterfowl populations, present and future
- impact on other migratory and resident bird populations, especially locally significant populations.

(c) Other Animals

- Impacts on life cycles of animal species and consequent impact on populations
- impact on predator-prey relationships should be determined.

7.2.3 Approach Light System

- Effects of causeways and approach light structures on water quality, currents,



sediment transport, salt marsh and delta growth or erosion and its relationship to estuarine productivity

- impact on intertidal banks, productivity of banks, nutrients and water circulation patterns, etc.
- impact on rearing and feeding areas for juvenile salmon and herring, and benthic organisms in the fish food chain which are dependent on intertidal banks and fore-shore marsh
- possible impacts from increased man induced lighting on marine life, bird use and predator-prey relationships.

#### 7.2.4 Dredging associated with the project

- In what locations and to what extent is dredging expected to be undertaken
- impact of dredging specifically required for the proposal on offshore and tidal areas including disruption of currents and scouring patterns, changes in turbidity and suspended levels at Sturgeon Bank and the North and Middle Arms of the Fraser River.





- impact of these changes on plant and animal (including fish) communities and species.

#### 7.2.5 Community and Social Planning Impacts

The methods used by Transport Canada to obtain the information required in this section should include direct consultation with organizations whose interests may be influenced by the project. The consultation process should be described in the EIS.

##### (a) Introduction

This section should identify the different social units that could be affected by the project. Two classifications should be used:

- i. local community/neighbourhood units  
(to include Marpole, Bridgeport, the Musqueam Indian Band, Burkeville, Brighthouse, University Endowment Lands, Southlands, Blenheim Flats, South Slopes)
- ii. regional social planning units (to include Richmond, the City of Vancouver and the G.V.R.D.)



(b) Local Community/Neighbourhood Units

A descriptive analysis of each community should be presented followed by an identification of anticipated impacts. This section should include, but not necessarily be limited to, the following information which should be presented on a community by community basis.

- i. demographic characteristics
- ii. an assessment of the social implications on the community of any project-induced changes in the physical and biological environments.
- iii. a summary of the noise impacts on each community as identified in the noise study.

(c) Regional Social Planning Units

All the information requirements for the Local Community Units section should be applied to the City of Vancouver, Richmond and the G.V.R.D. In addition, potential project impacts on other spheres of regional activity should be addressed, including,



- the impact of the project on population growth in the Lower Mainland
- the impact of the project on employment and airport-related economic activity in the Lower Mainland.

i. Local Government Policies

Describe the following local government planning policies and analyse the extent to which those planning policies might have to be modified as a result of the project:

(a) population growth policies and G.V.R.D.

Livable Region Program

(b) land use policies

(c) recreation policies

(d) transportation policies.

ii. Other Government Policies

Examine the proposal in light of the following:

- energy conservation
- existing land reserves on Sturgeon Bank and Sea Island





- Provincial Order-in-Council 908 relating to environmental assessments on Sturgeon and Roberts Bank
- any intergovernmental initiatives taking place in the region which may be impacted by the project.

(d) Local Group Perceptions Concerning the Project

This section should present local and regional government perceptions regarding the project impacts. It should also include special interest group concerns about the project. It should include but not necessarily be limited to:

- i. a description of the methodology used to document government and group perceptions regarding the project
- ii. a descriptive analysis of local and regional government perceptions of the project
- iii. a descriptive analysis of local and regional special interest group perceptions of the project (specifically those groups who have been involved with the project planning in recent years).



#### 7.2.6 Resource Allocation and Requirements

Project related changes in commercial activity, recreational activity, traditional harvesting or any other resource use patterns in the area or region. For example:

- possible changes to present recreation use of the foreshore both passive and active
- possible changes to land use and land values in the area
- possible alteration of options available for other land uses in areas surrounding the proposed site.

#### 7.2.7 Local and Regional Resources and Systems

- Changes in the local surface vehicle traffic patterns due to proposed airport construction and activity
- impact of increased air traffic on the regional transportation network
- potential alienation of land surrounding the development area
- impact of requirements for land consuming services, associated with the proposed runway.



#### 7.2.8 Cumulative Impacts of Developments

- A variety of development projects are proposed within the general area of reference. The impact of this project should be assessed briefly in the context of these developments including possible interactions.

### 8. MITIGATING MEASURES

- 8.1 Describe the present mitigation measures in effect for the area relative to airport operations. Discuss in terms of their costs, effectiveness and secondary impacts (bird hazard reduction, noise, etc.).
- 8.2 Describe and discuss ways proposed to modify the adverse environmental impacts which have been identified for the project. Priority should be placed on the mitigation of major or cumulative impacts. Mitigating measures proposed must be available for use at present but need not be restricted to those under the jurisdiction of the initiator. They should be technically, economically and administratively feasible.

### 9. RESIDUAL IMPACT

The environmental impacts that will remain after mitigating measures have been incorporated into the project should be





discussed. Included will be elements of ecosystems affected for either a short term or in perpetuity such as habitat degradation and essential food chain linkages or components.

#### 10. ENVIRONMENTAL IMPACTS RESULTING FROM ASSOCIATED OR INDUCED DEVELOPMENTS

In order to assess the long term impact of the proposal on the environment, discussion is required on: the spinoff development consequences of the proposals, on population distribution and concentration, and the secondary effects that these changes could have on the environment, natural resources and public services at all levels of government.

This discussion should focus on long range environmental changes which may result from changes emanating from or related to the proposal.

Environmental management strategies should also be proposed which would mitigate environmental impacts or enhance environmental values, whether or not the environmental concerns are within the jurisdiction of the initiator.

#### 11. MONITORING

Plans for monitoring the project effects as a result of the detailed analysis of environmental concerns should be described.



## 12. APPENDICES

To be included as appendices to the EIS are:

- A. A glossary of all technical and scientific terms used which may not be readily understandable by the public.
- B. Lists of references cited and literature used but not cited.
- C. A list with addresses of all consultants and government agencies associated with these studies and related evaluations along with the names of the individuals involved.



## A P P E N D I X

This appendix has been drafted by the Panel in order to assist Transport Canada in addressing questions and concerns related to project justification raised at public hearings on the draft guidelines in September 1977. It is a consolidation of input from many groups and individuals. It is not intended that Transport Canada's response to these questions and concerns form a part of the Environmental Impact Statement. (Refer to Section 2, page 4.)

### NEED FOR THE PROJECT

#### 1. Present Status

What is the present air traffic situation at Vancouver International Airport and in the Lower Mainland area, using current, comparable hourly, daily and annual statistics, in terms of:

- present capacity for aircraft categories (commercial carrier, general aviation, etc.) and system components, expressed in instrument flight rules (IFR) and visual flight rules (VFR) figures on a disaggregated basis
- state the policies and procedures upon which this capacity is based
- present demand for aircraft categories at each airport in IFR and VFR figures on a disaggregated basis. (With





- respect to commercial carriers this section should include consideration of the major Alberta airports.)
- present capacity and demand should provide detailed breakdowns of aircraft types (small planes, seaplanes, helicopters, major carriers) and types of air carriers (freight, charter, commercial air service) using the facilities
  - identify how much present air carrier traffic is in transit
  - the descriptions of present activity should represent a wide variety of operating conditions and should not rely on the averaging of statistics or on peak loading
  - assumptions used in the analysis should be explained.

## 2. Aircraft Use

- Provide an analysis of who uses airplanes (business, tourist, government, etc.)
- indicate demand from each and how the leisure/non-commercial use of aircraft affects the peaking factors
- provide an analysis of anticipated cost restriction to the leisure or other private use of air services (not charters)
- compare the groups of people which will be adversely affected by the project with groups which will benefit from it in terms of economic and social costs and benefits.



### 3. Project Need

Using the figures compatible with Section 2 explain the need and include:

- the forecast demand for the proposal including the comprehensive analysis of all factors likely to influence future demand for air traffic (rather than simple linear or exponential extrapolation of past trends)
- a full explanation of the forecasting methodology used
- the source of demand by aircraft type (large and small aircraft) and air carrier categories (freight, charter, etc.)
- provide a rationale on how the proposal fits in with local and regional transportation systems and priorities
- describe the effects of changes in fuel costs and trends in aircraft technology on forecast demand and capacity statistics
- all assumptions should be stated
- provide a comparison of costs and efficiencies with other modes of travel and alternative means of communication
- demonstrate need in the context of the potential social and economic advantage to the Lower Mainland as compared to re-routing and spreading of peak loads, other transportation modes and improved communications networks



- describe the air transportation needs within the western Canada context (B.C. and Alberta) and means of satisfying these needs
- indicate the life span of the use of the proposed runway
- provide a detailed comprehensive description of all the new facilities such as aircraft storage, terminal expansion, taxiways, etc. related to or ancillary to the proposed runway which would be required in this period.















